1. A method of operating a radar system comprising:

transferring a first series of pulses and a second series of pulses;

wherein the first series of pulses and the second series of pulses have orthogonal polarizations;

wherein the first series of pulses and the second series of pulses have a same pulse repetition time;

wherein the first series of pulses and the second series of pulses are offset by a time amount;

wherein a target reflects energy from the first series of pulses to generate a first series of echoes;

wherein the target reflects energy from the second series of pulses to generate a second series of echoes; and

processing the first series of echoes and the second series of echoes to determine a range and a velocity of the target.

2. The method of claim 1 wherein the first series of pulses and the second series of pulses each comprise blocks of the pulses, and wherein the blocks from the first series of pulses alternate between a lead position and a lag position with respect to the blocks from the second series of pulses.

3. The method of claim 2 further comprising phase coding the first series of pulses and the second series of pulses and wherein processing the first series of echoes and the second series of

echoes comprises decoding the phase coding to distinguish ones in the first series of echoes from adjacent ones in the second series of echoes.

4. The method of claim 3 wherein the orthogonal polarizations are substantially parallel and perpendicular to earth's surface.

5. The method of claim 3 wherein processing the echoes to determine the velocity of the target comprises co-processing ones in the first series of echoes with adjacent ones in the second series of echoes.

6. The method of claim 3 wherein processing the echoes to determine the range of the target comprises co-processing adjacent ones in the first series of echoes and co-processing adjacent ones in the second series of echoes.

7. The method of claim 3 wherein the pulse repetition time is in a range from one-half millisecond to four milliseconds.

8. The method of claim 3 wherein the time amount is in a range from one microsecond to 300 microseconds.

9. The method of claim 3 wherein the target comprises an atmospheric structure.

10. The method of claim 3 wherein the radar system comprises a Doppler weather radar system.

11. A radar system comprising:

a transmission system configured to transfer a first series of pulses and a second series of pulses, wherein the first series of pulses and the second series of pulses have orthogonal polarizations, wherein the first series of pulses and the second series of pulses have a same pulse repetition time, wherein the first series of pulses and the second series of pulses are offset by a time amount, wherein a target reflects energy from the first series of pulses to generate a first series of echoes, and wherein the target reflects energy from the second series of pulses to generate a second series of echoes; and

a reception system configured to process the first series of echoes and the second series of echoes to determine a range and a velocity of the target.

12. The radar system of claim 11 wherein the first series of pulses and the second series of pulses each comprise blocks of the pulses, and wherein the transmission system is configured to alternate the blocks from the first series of pulses between a lead position and a lag position with respect to the blocks from the second series of pulses.

13. The radar system of claim 12 wherein the transmission system is configured to phase code the first series of pulses and the second series of pulses and wherein the reception system is configured to decode the phase coding to distinguish ones in the first series of echoes from adjacent ones in the second series of echoes.

14. The radar system of claim 13 wherein the orthogonal polarizations are substantially parallel and perpendicular to earth's surface.

15. The radar system of claim 13 wherein the reception system is configured to co-process ones in the first series of echoes with adjacent ones in the second series of echoes to determine the velocity of the target.

16. The radar system of claim 13 wherein the reception system is configured to co-process adjacent ones in the first series of echoes and co-process adjacent ones in the second series of echoes to determine the range of the target.

17. The radar system of claim 13 wherein the pulse repetition time is in a range from one-half millisecond to four milliseconds.

18. The radar system of claim 13 wherein the time amount is in a range from one microsecond to 300 microseconds.

19. The radar system of claim 13 wherein the target comprises an atmospheric structure.

20. The radar system of claim 13 wherein the radar system comprises a Doppler weather radar system.